

## WHAT IS CLAIMED IS:

1. A process for activating a regenerated, but not re-activated, catalyst comprising:

5                   introducing said catalyst into an HCS reactor operating containing catalyst rejuvenation means at HCS process conditions whereby said catalyst is activated.

10                  2. The Process as in claim 1 wherein the HCS reactor operates in the range of 150-320°C.

                  3. The Process as in claim 1 wherein the HCS reactor operates in the range of 5.5-42.0 bar.

15                  4. The Process as in claim 1 wherein the HCS reactor hourly gas space velocities for syngas operates in the range of 100-40,000 V/hr/V.

                  5. The process as in claim 1 wherein the catalyst has as a component  
20 or is a compound of at least one metal selected from the group of Group VIII metals of the Periodic Table.

                  6. The process as in claim 1 wherein the catalyst has as a component  
25 or is a compound of at least one metal selected from the group of Fe, Ni, Co and Ru.

                  7. The process as in claim 1 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of at least one metal selected from the group of Group VIII metals and the second

catalyst metal has as a component or is a compound of at least one member selected from the group of Group VIIa or VIII elements of the Periodic Table.

8. The process as in claim 1 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of at least one metal selected from the group of Fe, Ni, Co and Ru and the second catalyst metal has as a component or is a compound of at least one member selected from the group of Re, Ru, Pt and Pd.

9. The process as in claim 1 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of Co and the second catalyst metal has as a component or is a compound of at least one member selected from the group of Re and Ru.

10. A process according to claim 1 wherein said regenerated, but not re-activated catalyst is obtained by:

removing a portion of said catalyst from said operating HCS reactor to a regeneration vessel;

subjecting the removed catalyst to a regeneration environment to form said regenerated catalyst

11. The process as in claim 11 wherein the said catalyst is removed on a continuous or semi-continuous basis

12. The process as in claim 11 wherein said regeneration environment is an oxidating environment

13. The process as in claim 11 wherein said oxidative environment operates at greater than 300 °C.

14. The process as in claim 11 wherein the catalyst has as a  
5 component or is a compound of at least one metal selected from the group of Group VIII metals of the Periodic Table.

15. The process as in claim 11 wherein the catalyst has as a  
component or is a compound of at least one metal selected from the group of Fe,  
10 Ni, Co and Ru.

16. The process as in claim 11 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of at least one metal selected from the group of Group VIII metals and the second  
15 catalyst metal has as a component or is a compound of at least one member selected from the group of Group VIIa or VIII elements of the Periodic Table.

17. The process as in claim 11 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of at least one metal selected from the group of Fe, Ni, Co and Ru and the second  
20 catalyst metal has as a component or is a compound of at least one member selected from the group of Re, Ru, Pt and Pd.

18. The process as in claim 11 wherein the catalyst is a bimetallic  
25 catalyst with the first catalyst metal has as a component or is a compound of Co and the second catalyst metal has as a component or is a compound of at least one member selected from the group of Re and Ru

19. The process as in claim 11 wherein said removed catalyst is filtered to remove at least a portion of reactants and products prior to entering said regenerative environment.

5           20. The process of claim 21 wherein the filtration is accomplished by  $H_2$  stripping.

21. A hydrocarbon synthesis process comprising:

10           providing a HCS reactor containing catalyst rejuvenation means;

          containing, or having introduced into said HCS reactor, at least one catalyst from the group of a fresh, passivated catalyst, a fresh, activated catalyst, a short-term deactivated catalyst or a long term  
15           deactivated catalyst;

          contacting said catalyst with  $H_2$  and CO at a mole ratio between 0.5 to 4.0, a temperature range of 150-320°C, a pressure range of 5.5-42.0 bar and an hourly gas space velocity of 100-40,000  
20           V/hr/V at standard volumes;

          periodic or continuous removal of said catalyst to a regeneration vessel producing regenerated, but not re-activated, catalyst; and

25           returning said regenerated, but not re-activated, catalyst to said HCS reactor whereby said regenerated, but not re-activated, catalyst is re-activated at HCS operating conditions.

22 The process as in claim 23 wherein the catalyst has as a component or is a compound of at least one metal selected from the group of Group VIII metals of the Periodic Table.

5 23 The process as in claim 23 wherein the catalyst has as a component or is a compound of at least one metal selected from the group of Fe, Ni, Co and Ru.

10 24 The process as in claim 23 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of at least one metal selected from the group of Group VIII metals and the second catalyst metal has as a component or is a compound of at least one member selected from the group of Group VIIb or VIII elements of the Periodic Table.

15 25 The process as in claim 23 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of at least one metal selected from the group of Fe, Ni, Co and Ru and the second catalyst metal has as a component or is a compound of at least one member selected from the group of Re, Ru, Pt and Pd.

20 26 The process as in claim 23 wherein the catalyst is a bimetallic catalyst with the first catalyst metal has as a component or is a compound of Co and the second catalyst metal has as a component or is a compound of at least one member selected from the group of Re and Ru